AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (previously presented) An optical communication system comprising:

an optical communications route comprising system fiber or a laser pigtail fiber having a given mode field radius at an operating wavelength of the system,

an optical route component for performing a function within the optical system, said optical route component forming part of the optical communications route and being connected to the system fiber or a laser pigtail fiber, and enclosed in a sealed container,

the optical route component providing an optical output which passes along the system fiber or the laser pigtail fiber from the container, the output of the optical route component passing through a mode field transformer and thence along the system fiber or the laser pigtail fiber,

the mode transformer including a section of optical fiber disposed at a location downstream of said container and serving to increase locally the mode field radius at said wavelength,

the optical system being operated with an optical power density in the system fiber or the laser pigtail fiber above a level at which optical power induced damage can propagate in the system fiber or the laser pigtail fiber,

the mode transformer reducing the optical power density for said given power level such that within the mode transformer the power density is reduced below the threshold level, so that in the event that optical power induced damage occurs in the system fiber or the laser pigtail fiber downstream of said mode transformer is prevented from propagating into the optical route component.

2. (previously presented) A system according to claim 1, wherein the mode transformer and the system fiber or laser pigtail fiber are made of glass.

3. (previously presented) A system according to claim 1, wherein the section of optical fiber included in the mode transformer includes a waist portion, wherein the diameter or cross sectional area of the waist portion is smaller than the diameter or cross sectional area of the system fiber or pigtail fiber.

4. (previously presented) A system according to claim 3, wherein said waist portion is symmetrically disposed about the longitudinal axis of the section of optical fiber included in the mode transformer.

5. (previously presented) A system according to claim 1, wherein at least part of said container and said mode field transformer are disposed within a housing.

6. (original) A system according to claim 5, wherein said mode field transformer is readily accessible within said housing.

7. (previously presented) A system according to claim 1, wherein said optical component includes an optical transmitter or an optical receiver or a fiber amplifier or a semiconductor amplifier or an arrayed waveguide grating or a planar silica waveguide.

8. (previously presented) An optical device for use in a system according to claim 1, said device including an optical route component for performing, in use, a function within the optical system, and being enclosed in a sealed container, the optical route component having a fiber pigtail for connection to a downstream optical fiber of said system, the optical route component providing an optical output having in said fiber pigtail a given mode field radius at an operating wavelength of said device;

the device further including a mode field transformer including a section of optical fiber, said mode field transformer being disposed at a location downstream of said container between said container and said fiber pigtail, said mode field transformer having a mode field radius at said wavelength substantially larger than said given mode

field radius and being sufficiently large to reduce at said location the optical power density of said optical output to below the threshold level at which optical power induced damage can occur in said pigtail fiber downstream of said mode field transformer, thereby, in the event that optical power induced damage occurs in the pigtail fiber, preventing the damage from propagating into the optical route component.

9.-10. (canceled)

11. (previously presented) A method of protecting an optical communications route carrying a high power optical signal from catastrophic damage caused by the propagation of optical power induced damage along said route, said method comprising:

identifying a site where optical power induced damage is likely to be initiated and the likely path of damage propagation,

selecting a route component to be protected, disposed in said path, disposing a mode field radius transformer at a location in said optical communications route between said identified site and said selected component,

the optical communications route having an optical fiber transmission path connecting said site and said component, the optical fiber having a given mode field radius at an operating wavelength of the signal,

the power density of said optical signal in said fiber being at a level at which optical power induced damage can propagate in said fiber, said mode field radius transformer including a section of optical fiber to increase substantially the mode field radius with respect to said given mode field radius so that the optical power density in the mode field transformer is reduced to a level at which optical power induced damage cannot propagate through the mode field transformer, so that optical power induced damage will be halted at said location before reaching said component.

12. (canceled)

13. (currently amended) A mode field transformer including a section of optical fiber which provides a ~~significant~~ localized increase in mode field radius from that of adjacent system fiber to serve as a barrier to the propagation of optical power induced optical damage from the system fiber through the mode field transformer by decreasing optical power density to a level below which propagation of optical power induced optical damage is supported, the optical fiber of the mode field transformer including a waist portion having a cross-sectional area that is lower than the cross-sectional area of the adjacent system fiber.

14. (previously presented) A system according to claim 3, wherein the diameter or cross-sectional area of the waist portion has a dimension so that an amount of optical power necessary for the optical power density to be reduced below the threshold level is leaked.

15. (previously presented) An optical communications route comprising a deployed system fiber which is at least 100 meters in length, the system fiber having a given mode field radius at a given wavelength at which the fiber is designed to operate, said system fiber being provided with a mode field transformer at each end of said fiber, each mode field transformer having at said wavelength a mode field radius at least three times said given mode field radius;

wherein the mode field transformer includes a waist portion having a cross-sectional area which is smaller than the cross-sectional area of the system fiber.

16. (previously presented) A route according to claim 15, wherein the cross-sectional area of the waist portion has a dimension so that an optical power of an optical signal transmitted by the optical communications route is leaked.

17. (previously presented) A plurality of mode field radius transformers according to claim 18, wherein at least one mode field radius transformer includes a waist portion having a cross-sectional area with a dimension so that an amount of optical power

necessary for the optical power density to be reduced to a level below the threshold is leaked.

18. (previously presented) A plurality of mode field radius transformers disposed in an array, being arranged in use, so that each mode field radius transformer is connectable or spliceable with a respective system fiber in which at a given wavelength the mode field radius of an optical signal is x, each mode field radius radius transformer being arranged to increase the mode field radius of said optical signal, with respect to x, so that the power density of said optical signal in said mode field radius transformer is reduced to a level below the threshold required for optical power induced damage to propagate within the mode field radius transformer;

wherein at least one of the mode field radius transformers includes a waist portion having a cross-sectional area which is smaller than the cross-sectional area of the respective system fiber connected or spliced with that at least one mode field radius transformer.

19. (previously presented) A method according to claim 11, wherein the section of optical fiber included in the mode field radius transformer includes a waist portion having a cross-sectional area which is smaller than a cross-sectional area of the optical fiber transmission path connecting said site and said component.

20. (previously presented) A method according to claim 11, wherein a cross-sectional area of a waist portion of the mode field radius transformer has a dimension so that an amount of optical power, necessary for the optical power density of the optical signal to be reduced below the level at which optical power induced damage cannot propagate through the mode field radius transformer, is leaked.

21. (previously presented) A method of protecting an optical communications route carrying a high power optical signal from the propagation of optical power induced damage along the route, the route including an optical device

including a route component for performing a function within the optical route, said route component being housed in a container, said method including:

providing an optical fiber section at a location in said optical communications route outside said container, the optical fiber section being so dimensioned as to decrease the optical power density within said optical fiber section to a level below that at which catastrophic damage propagation is supported, so that optical power induced damage propagating in the route immediately downstream of said location will be halted at said location before reaching said container;

wherein the dimension of the optical fiber section to decrease the optical power density within the optical fiber section to a level below that at which catastrophic damage propagation is supported has a cross-sectional area which is smaller than the cross-sectional area of another optical fiber section in the optical communications route.

22. (previously presented) An optical communications system comprising:

a source of optical power;

an optical communications route having a first optical fiber portion, a mode field radius transformer and a second optical fiber portion, the first optical fiber portion receiving an optical communications signal from the source of optical power and passing the optical communications signal through the mode field radius transformer to the second optical fiber portion in a downstream direction;

wherein the mode field radius transformer transforms a mode field radius of the optical communications signal and includes a waist portion having a cross-sectional area which is smaller than the cross-sectional area of the first and second optical fiber portions.

23. (previously presented) A system according to claim 22, wherein the cross-sectional area of the waist portion is sufficiently small so as to halt at the waist portion any self-focusing damage which reaches the waist portion.

24. (previously presented) A system according to claim 22, wherein the cross-sectional area of the waist portion has a dimension so that optical damage propagating in an upstream direction towards the source of optical power is halted by the mode field radius transformer.

25. (previously presented) An optical communications system comprising:

a source of optical power;

an optical communications route having a first optical fiber portion, a mode field radius transformer and a second optical fiber portion, the first optical fiber portion receiving an optical communications signal from the source of optical power and passing the optical communications signal through the mode field radius transformer to the second optical fiber portion in a downstream direction;

wherein the mode field transformer includes a waist portion having a cross-sectional area so that an amount of optical power is leaked so as to reduce the power density of the optical signal to a level below a threshold required for propagation of optical power induced damage to occur.

26. (previously presented) A system according to claim 25, wherein the cross-sectional area of the waist portion has a dimension so that the optical power induced damage propagating in an upstream direction towards the source of optical fiber is halted by the mode field radius transformer.